



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/926,465	02/12/2002	Masakazu Furukawa	215648US0PCT	4689

22850 7590 04/02/2004

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER

PAIK, SANG YEOP

ART UNIT PAPER NUMBER

3742

DATE MAILED: 04/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/926,465

Applicant(s)

FURUKAWA ET AL.

Examiner

Sang Y Paik

Art Unit

3742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-9 and 14-28 is/are pending in the application.
- 4a) Of the above claim(s) 14-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7 and 17-28 is/are rejected.
- 7) ☒ Claim(s) 8 and 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1/28/04, 3/8/04
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5, 17-22 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumura et al (US 5,151,871) in view of Kawanabe et al (US 6,133,557) or Yoshida et al (US 6,080,970).

Matsumura et al shows a ceramic heater having a ceramic substrate with a heating element film made of molybdenum or nickel formed on the lower surface of the ceramic substrate. Matsumura et al further discloses that the heating element has the thickness of 0.1 to 100 microns, and, preferably in a range of 0.5 to 2 microns. When the heating element is in the thickness of .5 to 2 microns, the heating element thickness dispersion is within 3 microns. However, Matsumura does not disclose that the ceramic substrate is in a disc form.

Kawanabe et al or Yoshida et al shows a ceramic heater having a disc-shaped ceramic substrate made of aluminum nitride with a heating film formed on the ceramic substrate and subsequently dried using the sintering process to integrally form the ceramic heater. In view of Kawanabe et al or Yoshida et al, it would have been obvious to one of ordinary skill in the art to adapt Matsumura et al with a disc-shaped ceramic substrate to accommodate the disc-shape of the semiconductor wafer so as to uniformly heat a semiconductor wafer.

Art Unit: 3742

Claim 22 is a product by process claim, and while the recited RF sputtering process is not explicitly disclosed, it would have been obvious to use various methods and processes to provide the heating element as a conductive film to a ceramic substrate to make an integral heating device having a good adhesion between the heating element and the ceramic substrate in order to provide a uniform heating surface. Furthermore, it is noted that the determination of the patentability of the product/apparatus does not depend on its method of production but by structure of the product if the product is same or obvious from a product of the prior art. In this case the structure of the claimed product is the same as that of the prior art even though the prior art was made by a different process. Also see MPEP 2113.

With respect to claims 2 and 18, Matsumura et al does not explicitly disclose that the heating element has the thickness dispersion within 1 micron. However, it would have been obvious to one of ordinary skill in the art to provide the heating element having a uniform thickness so that a uniform electric resistance can be achieved.

3. Claims 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumura et al in view of Kawanabe et al or Yoshida et al as applied to claims 1-5, 17-22 and 28 above, and further in view of Morita et al (US 5,118,983) or Tsuruta et al (US 5,554,839).

Matsumura et al in view of Kawanabe et al or Yoshida et al discloses the hot plate claimed except the resistance element made of scaly noble metal powder.

Morita shows a hot plate made of nitride ceramic with a resistance element made of TiN, W as well as noble metals such as Pt with a glaze layer having the oxide and organic vehicle fused with the resistance element. Tsuruta et al shows a ceramic heater having a ceramic

Art Unit: 3742

substrate with a metal paste having the scaly noble metal including a noble metal such as platinum, alumina and an organic vehicle.

In view of Morita et al or Tsuruta et al, it would have been obvious to one of ordinary skill in the art to adapt Matsumura et al, as modified by Kawanabe et al or Yoshida et al, with the heating element made of the scaly noble metals to provide a ceramic heater that is capable of withstanding a high thermal resistance and to further prevent cracks.

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumura et al in view of Kawanabe et al or Yoshida et al as applied to claims 1-5, 17-22 and 28 above, and further in view of Fennimore et al (US 3,576,722) or DiGiacomo et al (US 5,442,239).

Matsumura et al in view of Kawanabe et al or Yoshida et al discloses the hot plate claimed except the resistance element made of a multilayer structure.

Fennimore et al shows a multilayer resistance pattern deposited on a ceramic substrate having a titanium layer being the first layer deposited thereon with additional layers such as copper and gold being deposited on the titanium layer. Fennimore et al teaches that the titanium layer serves as a good adhesion layer to the ceramic substrate. DiGiacomo et al also shows a multilayer structure with a titanium or chromium layer being the first layer deposited on the ceramic substrate. DiGiacomo et al teaches that such multilayer structure provides low stress, minimal corrosion and strong adhesion to the ceramic substrate.

In view of Fennimore et al or DiGiacomo et al, it would have been obvious to one of ordinary skill in the art to adapt Matsumura et al, as modified by Kawanabe et al or Yoshida et al, with a multilayer structure with titanium or chromium being the layer nearest to the ceramic

Art Unit: 3742

substrate to provide a resistance layer that provides low stress and corrosion while providing strong bonding of the resistance layer to the ceramic substrate.

***Allowable Subject Matter***

5. Claims 8 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

6. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Art Unit: 3742

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Y Paik whose telephone number is 703-308-1147. The examiner can normally be reached on M-F (8:00-5:30) First Friday Off.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Paik

Sang Y Paik  
Primary Examiner  
Art Unit 3742

syp